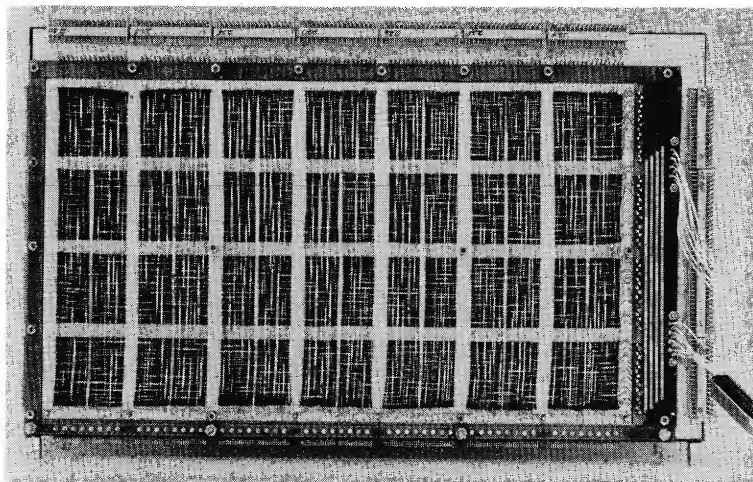


ENGINEERING NOTE

NO. 669

electronic memories inc.

12621 Chadron Avenue • Hawthorne, California 90250
• (213) 772-5201



16,384 14-BIT NANOSTACK

$2\frac{1}{2}$ D NANOSTACKTM

- for large, high-speed memories of 8,192 or more words
- 700 or 900 nanosecond read/write cycle time

The EMI $2\frac{1}{2}$ D NANOSTACK employs two and one-half dimensional organization (3 wires), which has the decoding advantage of a three dimensional (4-wire coincident current read and write) organization, and the low-cost planar array stringing advantages of a two dimensional (linear select) organization. All drive and sensing circuitry is mounted on the core array frame, and all interfacing with the array is done with logic signals. The design approach eliminates stringing of the inhibit (fourth wire), reducing magnetic assembly costs.

HIGH SPEED:

The $2\frac{1}{2}$ D NANOSTACK is available with a 900 nanosecond read/write cycle time using a 30-mil core, or 700 nanosecond cycle time with a 20-mil core. Extremely short drive lines enhance operational speed. No drive line is longer than 1,152 cores in a 16,384x18 stack, as compared with the normal 2,304 cores on an x or y drive line in a three dimensional selection stack, or 4,096 cores on an inhibit line in a similar stack.

LOW SYSTEM NOISE:

Absence of the inhibit current eliminates digit noise in the sense line. The maximum common intersection for any sense and drive line is only 256 cores. Thus, no time is required for digit noise recovery from the previous cycle.

2 $\frac{1}{2}$ D NANOSTAK

WIDE OPERATING MARGINS:	Because the 2 $\frac{1}{2}$ D NANOSTAK employs only two drive currents, margins are substantially wider than in conventional coincident current design, where variations in three drive currents can offset margins.
NO READ/WRITE TIME SEPARATION:	No time is required to settle the digit before turning on the write current, as an inhibit current is not used.
REDUCED CONNECTOR LENGTH:	Open-flat construction allows drive circuitry to be positioned around the stack, reducing the length of connectors to the stack.
LOW SUPPLY VOLTAGES:	The 900 nanosecond stack requires a maximum of ± 12 volts, permitting the use of low-cost semiconductors. There are no terminating resistors.
OPERATING TEMPERATURE:	The range is 10 C to 40 C, with an optional range from 0 C to 50 C.

PHYSICAL SIZE:

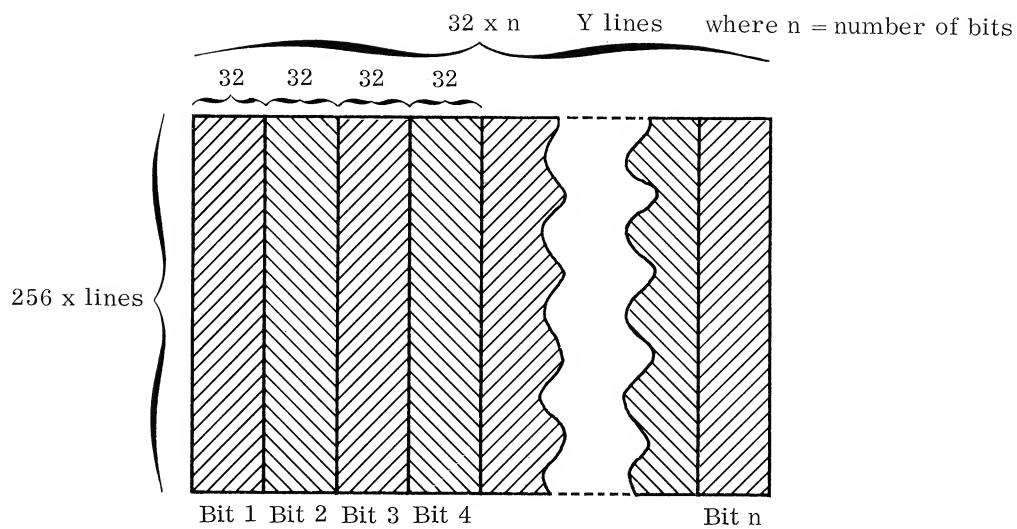
Number of Words	Word Length	Length Breadth Height
16,384	15 to 18	20.8" x 10.6" x 2"
16,384	up to 14	17.0" x 10.6" x 2"
8,192	19 to 24	17.6" x 10.6" x 2"
8,192	up to 18	13.1" x 10.6" x 2"

CHARACTERISTICS

Frames are wired with 256 bits in the y direction and $n \times 32$ bits in the x direction for a 16,384-word stack and $n \times 16$ bits in the x direction for a 8,192-word stack where n is the number of bits. The 16,384-word stack has a maximum of 18 bits. The 8,192-word stack has a maximum of 24 bits. For applications requiring a larger number of bits, multiple stacks are used.

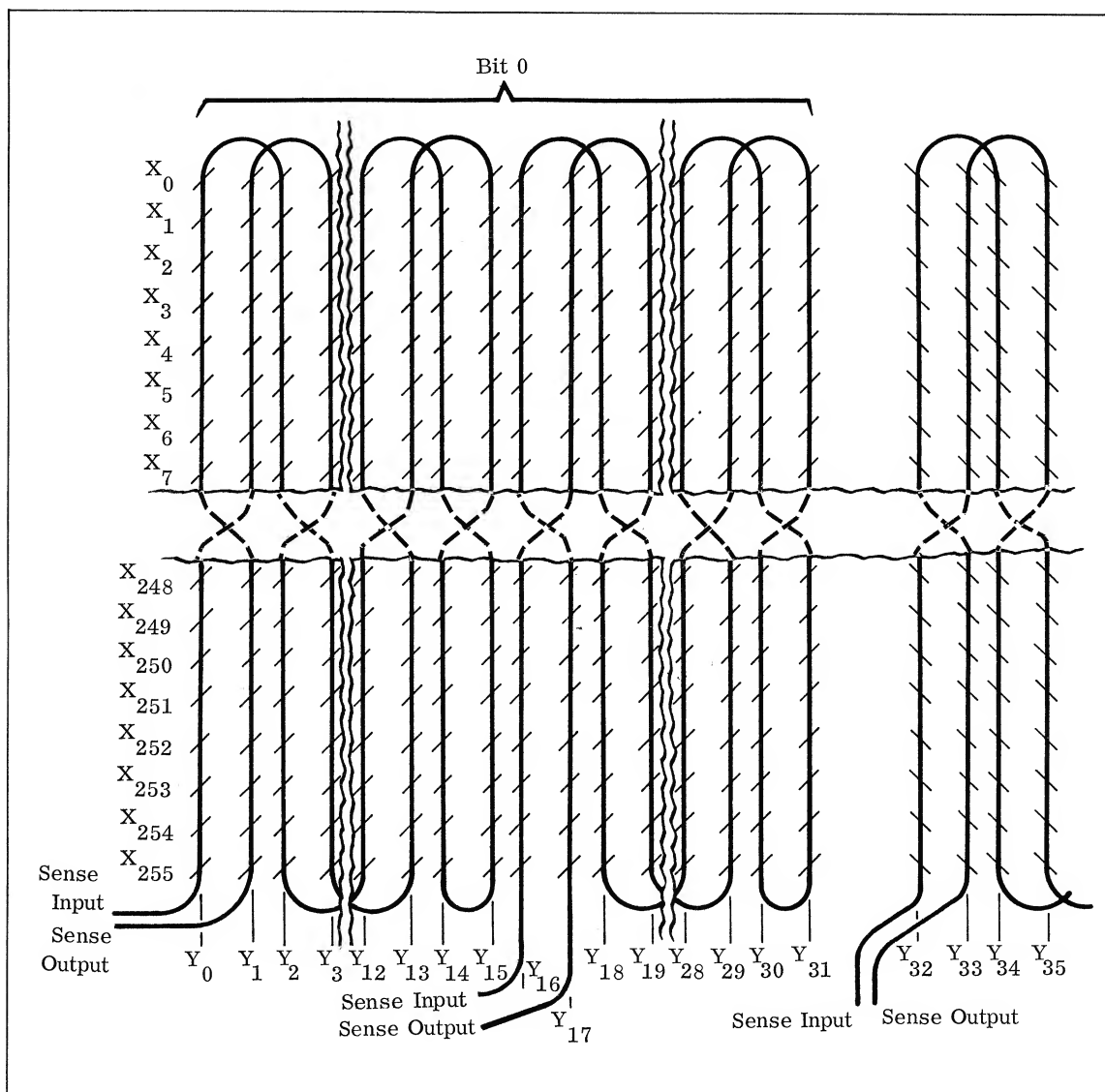
Sense windings link 256 x 16 cores or 4,096 cores. In a 16,384-word stack, each bit has 4 sense windings. A 8,192-word stack has two sense windings per bit.

Cores are mounted on 25-mil centers.



LOGICAL ORGANIZATION OF $2\frac{1}{2}$ D NANO-ARRAY

Diagram shows one side of a 16,384 word x n bit NANOSTAK. Cross-hatched areas indicate the cores in one bit. The 8,192-word stack is organized in a similar fashion, except that one bit is represented by an area 256 x 16 on each side of the stack.



DETAIL WIRING OF ONE BIT, 2 $\frac{1}{2}$ D NANO-ARRAY

electronic memories inc.

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Thank you for your recent inquiry. The information you requested is enclosed. We look forward to supplying you with ferrite memory cores, arrays and stacks, or complete memory systems.

For your convenience, your nearest EMI representative is listed below.

ALABAMA

The Roy Attaway Company
900 Bob Wallace Avenue
Huntsville, Alabama 35801
(205) 534-2811
TWX 205-533-1714

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20274 Stout
Detroit, Michigan 48219
(313) 538-5704

Southwest Electronic Industries, Inc.
6001 Gulf Freeway, Room C-102
Houston, Texas 77023
(713) WA 8-5251

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Minneapolis, Minnesota 55415
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TWX 612-321-0894

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